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CENTRAL INTELLIGENCE AGENCY

INFORMATION REPORT

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SUBJECT Acetylcholine and Cholinesterases Research Work and Workers

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SUPP. TO REPORT

THIS IS UNEVALUATED INFORMATION

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1. It must be realized at the outset that the study and research in the field of acetylcholine and cholinesterase are so closely connected with any physiological study of the nature of muscle contraction and of the nature of the transmission of signals through nerve fibers that it is quite impossible to segregate the two areas from each other on any fundamentally different positions. Therefore, it should be realized that any trained and intelligent scientist working in any one of these areas is likely to know both the theoretical background and the practical techniques applicable to the other areas in this group. Consequently, and from the standpoint of potential, any institution that deals with the subjects of muscular action and nervous systems, and related subjects, is also quite capable of doing research and development work in the cholinesterase field. As can be readily seen, this opens up almost every biochemical and biological institution on the subject.

2. the most outstanding research workes in the USSR in the field of the cholinesterases Khristofer S Koshtoyants,

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he is either connected or affiliated with the following: (a) M V Lomonosov State University, Moscow; (b) Timiryazev Biological Institute of the Department of Comparative Physiology, Moscow; (c) A A Severtsov Institute of Animal Morphology of the Academy of Sciences of the USSR, Moscow.

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3. Koshtoyants is undoubtedly an eminent man in Soviet biochemistry as evidenced by his position as editor of the biological section of the Great Soviet Encyclopedia, a position of considerable trust as is obvious in the circumstances.

4. His publications in the field of biochemistry are most numerous and, at times, do bear on the subject of acetylcholine. In general, his work may be summarized as a study of interaction of musculature with the nervous system. Among the people in his research group are the following: N N Demin, S N Nistratova, L S Rozanova, G D Smirnov, A L Byzov, Yu I Rampan, Z A Yanson and N N Bulatova. Among the more important of the recent publications are the following: (a) Proteins and Nervous Regulation, a book by that title published in 1951; (b) Paths of Action of the Vagus Nerve on Heart Action, Doklady Akad Nauk SSSR 88, No 2, 369 (1952); (c) Action of Thiol Poisons on the Conduction of Nerve Stimuli (Trudy Severtsov Institute of Animal Morphology, No 6 (1952)), published in Doklady Akad Nauk SSSR 87, 155 (1952). In this work it was found that cadmium, a thiol poison, can stop nerve transmission without affecting nerve sensitivity to acetylcholine or potassium ions; (d) Nervous System in Maintenance of Glycogen Structure, published in Doklady Akad Nauk SSSR 75, 881 (1950); (e) Activity of Cholinesterase in Erythrocytes with Different Hemolytic Stabilities, published in Doklady Akad Nauk SSSR 71, 199 (1950).

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6. In the actual work on research and development in the field of the cholinesterases, it would probably be more correct to list at the top of the list, and even ahead of Koshtoyants, a man by the name of Evgenii Borisovich Babskii.

7. Babskii's address is Moscow, and he is connected with, or affiliated with, the following: (a) Lenin State Pedagogic Institute, Moscow; (b) Institute of Biological and Medical Chemistry of the Academy of Medical Sciences of the USSR at Moscow. He has had numerous publications of quite high quality dealing fundamentally with the nature of nerve stimuli. With the discovery of cholinesterase in recent years, many of his publications deal with this subject. Examples of recent ones are the following: (a) The Effect of Adenosinetriphosphate (ATP) on Cerebral Cortex (with I I Malkiman), in Doklady Akad Nauk SSSR 74, 1135 (1950); (b) The Effect of Glycolysis Block on Nerves in Contraction (with V A Novi) in Doklady Akad Nauk SSSR 70, 335 (1950): The Effect of Adenosinetriphosphate (ATP) on Muscle Contraction, ibid 78, 1061 (1951); (c) The Effect of Thiamine Derivatives on Sensitivity of Muscle to Acetylcholine (with P F Minaev) in Fiziol Zhur 34, 389 (1948); (d) The Action of Acetylcholine on Nerve Centers (with V V Artem'ev) in Fiziol Zhur 35, 623 (1949); The Action of Eserine, Atropine and Prostigmine on Electric Activity of Visual Lobes, ibid 36, 151 (1950); (e) Chemical Nature of Substance of the Brain Tissue which Sensitizes Muscles to Acetylcholine (with P F Minaev) in Biokhimiya 12, 231 (1947). This paper indicates that the substance in question is probably adenosinetriphosphate (ATP). The paper is sound in its technique and is important to workers dealing with the biochemistry of the nervous system.

8. Babskii appears to have the most firsthand know-how in this area of work, on the basis of his own experimental research and development. 50X1-HUM

9. The following people listed below 50X1-HUM
All seem to be competent people who have been doing recent work with cholinesterase and related matters. These people then are as follows; but, 50X1-HUM are not necessarily listed in the order of their decreasing importance: (a) N G Berim of the Leningrad

Agricultural Institute. His most recent publication is titled, "Effect of DDT and BHC on Enzymes of Insects", in Doklady Akad Nauk SSSR 84, 393 (1952). This work relates cholinesterase activity to the resistance of insects to these insecticides; (b) G D Smirnov of the A A Severtsov Evolution and Morphology Institute, Moscow, whose most recent publication is "Mechanism of Action of Diisopropylfluophosphate" in Doklady Akad Nauk SSSR 58, 689 (1947). This is one of the very few Soviet publications dealing with known war gases; (c) A G Anikin of the Institute of Biophysics of the Academy of Sciences of the USSR. He is a worker in the field of nerve-muscle interaction. His most recent publication in this field appears in Doklady Akad Nauk SSSR 87, 727 (1952) and 87, 947 (1952); (d) R G Lyudovskaya, [redacted] 50X1-HUM has been doing similar work in the field of nerve-muscle interaction. His most recent publication appears in Doklady Akad Nauk SSSR 87, 731 (1952); (e) I N Volkova of the Kazan State Medical Institute, whose most recent work, "Acetylcholine in the Development of Central Nerve Block", appears in Fiziol Zhur 37, 422 (1951). This work points out that acetylcholine is the active principle which blocks the nerve action when a perfusate of frog spinal cord is applied to the nerve. The work appears to be the only one published by this worker and seems to be quite sound. It is significant in that it was done at Kazan where a considerable concentration of work on phosphorous compounds is known to exist; (f) N N Mel'nikov. The recent publication of several papers on phosphate insecticides indicates that this man is at least familiar with recent work on anticholinesterases.

10. Among the older Soviet workers whose studies have been known for a long time and who have been prominent in the biological sciences, and therefore who can be expected to be abreast of cholinesterase work, should be included the following: (a) L A Orbeli [redacted] work is in the field of nerve physiology; 50X1-HUM (b) A L Speranskii [redacted] a worker in the field of the medicine of the nervous system; (c) A V Palladin of the Ukrainian Academy of Sciences Biochemical Institute, whose interest lies in the field of muscle activity.

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11. All of the so-called nerve gases [redacted] are anti-cholinesterases, that is, they are substances which inactivate or stop the action of cholinesterase. The latter, in turn, is the controlling factor in maintaining the proper balance between choline and acetylcholine, which is essential for normal signal transfer through nerves. Hence, any work with cholinesterase can be utilized in work on anti-cholinesterases and, of course, vice versa.

[redacted]

12. A representative selection of Soviet journals most apt to carry publications on cholinesterase work is as follows: (a) Doklady Akad Nauk SSSR; (b) Mikrobiologiya; (c) Zhur Obshchei Biologii; (d) Fiziol Zhur SSSR; (e) Uspekhi Sovremennoi Biologii; (f) Zhur Obshchei Khimii; (g) Trudy Instituta im Severtsova Morfol Zhivotnykh; (h) Biokhimiya.

[redacted]

13. The proportion of published material in this field is probably a very small fraction of the total [redacted] 50X1-HUM 10% of Soviet research and development in this field, since 1945 at least, has been made available in overt-published material.

[redacted] 50X1-HUM

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14. (a) Lomonosov State University, Moscow; (b) Institute of Biol Med Chem of the Academ of Sciences of the USSR, Moscow; (c) State Pedagog Inst, Moscow; (d) Severtsov Animal Morphol Inst, Moscow; (e) Biophysics Institute; (f) Kazan State Medical Institute; (g) Microbiological Institute, Moscow; (h) Bakh Biochemical Institute; (i) Institute of Organic Chemistry of the Academy of Sciences of the USSR, Moscow.

The follcwing is a list of the titles of open published research.

(a) The Pharmacological Characteristics of Carbo-Choline (M A Nekrasova), Chair of Pharmacology and Toxicology of the Leningrad Veterinary Institute. Published Journal of Pharm and Tox, vol 4, No 2, p 72, 1941.

(b) The Chemical Nature of the Substance of the Brain Sensitizing Muscles to Acetylcholine (E B Babskii and P F Minaev), Physiol Lab of the Institt of Biol and Med Chem, Acad Med Sci. Published Biokhimiya, vol 12, No 3, p 131, 1947.

(c) Action of Narcotics upon the Action of Cholinesterase. IV. Narcotic Power of Different Narcotics as Compared with Their Inhibitory Action upon the Activity of Cholinesterase (M Ya Nikhelson), Chair of Pharmacology of the Naval Medical Academy, Leningrad. Published in Physiological Journal, vol 32, vol 6, p 745, 1946.

(d) The Cholinesterase of Invertebrates (Kh S Koshtoyants), Dept of Comparative Physiology of the Biol Institt im Timiryazev, Moscow. Published Ukrainian Journal of Biochemistry, Vol 9, No 3, p 665, 1936.

(e) The Significance of Acetylcholine in Establishing Central Nerve Block (I N Volkova). Published Physiological Journal, vol 37, No 4, p 422, 1951.

16. Now then with respect to the article by Babskii and Minaev, this substance reported on is probably adenosinetriphosphate (ATP)

translation of this article as follows: The Chemical Nature of the Substance of the Brain Tissue Which Sensitizes Muscles to Acetylcholine.

17. With respect to the paper by Koshtoyants, on the cholinesterase of invertebrates, this article deals with the presence of cholinesterase found in various snails and other invertebrates. In itself it is simply a biochemical paper without very great significance in the field of biological warfare, although there is no doubt as to the competence of the author.

18. With respect to the article by Volkova, 50X1-HUM
translate the article as follows: "Acetylcholine in the Development of Central Nerve Block".

medical personnel:

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Aleksandrov, N A, Lt Col Mbr, Veterinary Service, 1949. Veterinary Medicine

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El'bert, B Y, Prof, Rostov Sci Res, Anti-Plague Inst, 1946, Bacteriology

Faybich, M M, Col Mbr, Specially Dangerous Infections Sec, Microbiol, Dept Sanitation Hygiene Res Inst, Soviet Army c 1948 - Medicine.

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Grudenkov, A S, Mbr, Specially Dangerous Infections Sec, Microbiol Dept, Sanitation-Hygiene Res Inst, Soviet Army, c 1948. Medicine

Iyerusalimskiy, N D, Mbr Inst Microbiol, Dept Biol Sci, Acad Sci 1940-45. Microbiology

Khatamever, L M Prof, Ch, Tularemia Lab, Dept Path of Specific Infections, Inst Epidem, Microbiol and Infectious Diseases im N F Gamaleya, Dept Hygiene, Microbiol and Epidemiology, Acad Med Sci, 1947. Medicine

Kopylov, N F, Mbr Specially Dangerous Infections Sect, Microbiol Dept, Sanitation-Hygiene Res Instit, Red Army Kuibyshev, c 1948. Medicine

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Matveyev, K I Prof, Mbr Inst Epidemiology, Microbiology and Infectious Diseases im N F Gamaleya, Dept Hygiene, Microbiol and Epidemiology, Acad Med Sci, 1947, c 49. Medicine

Mayskiy, I N, Cand Med Sci. Medicine

Meysel', M N, Dept Biol Sci, Acad Sci (Mbr Inst Biochem im Bakh 1949; Mbr Inst Microbiol 1949). Medicine Microbiology

Muromtsev, S N (Prof) Dir, a lab, Livestock Div, All-Union Acad, Agricultural Sci im V I Lenin, 1942-48. Veterinary Medicine

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Ptuskin, I V, Mbr, Specially Dangerous Infections Sect, Microbiology Dept, Sanitary-Hygienic Res Inst Soviet Army, Kuibyshev, c 1949. Bacteriology

Romanov, P F, Mbr, Specially Dangerous Infections Sect, Microbiol Dept, Sanitary Hygiene Res Inst, Soviet Army Kuibyshev, c 1948. Stalin 3rd Prize, 1947 vaccines, bacteriophages, 7 antibiotics. Member of N N Ginsburg group

Smorodintsev, A A (1901), Prof, Infection Clinic, All-Union Inst Experimental Med, c 1948, M D Omsk Univ, 1923. Medicine

Timakov, V D (Prof) (1905), Dir Inst Epidem, Microbiol and Infectious Diseases im N F Gamaleya, Dept Hygiene, Microbiol and Epidemiology, Acad Med Sci, c 1950. Bacteriology

Zhukov-Verezhnikov, N N Prof (1908), Mbr Presidium, Acad Med Sci, 1950. Medicine

Zil'ber, L A (1894) Mbr, Inst Epidem and Microbiol im N F Gamaleya, Dept Hygiene Microbiology and Epidemiology, Acad Med Sci 1949. Medicine, Microbiology 50X1-HUM

19. 50X1-HUM

20. 50X2-WMD

21. Ierusalimskii is a sound and well known worker in the field of chemistry of micro-organisms, and could well be expected to be in or abreast of various phases of bacteriological work. He is affiliated with both the Lomonosov State University in Moscow and the Microbiological Institute of the Academy of Sciences of the USSR in Moscow. Typical recent publications of his include (a) a book published in Moscow by the Academy of Sciences in 1949, titled "Nitrogenous and Vitamin Diet of Microbes" (Azotnoe i vitaminnoe pitanie mikrobov); (b) Plant Growth Hormones, a review of plant growth regulators appearing in Mikrobiologiya 16, 255 (1947); (c) Vitamins in Microbe Development, a review in Mikrobiologiya 16, 336 (1947); (d) Trace Elements in Acetone Bacteria, in Doklady Akad Nauk 76, 913 (1951); (e) Development of Butyric Acid Bacteria, in Mikrobiologiya 20, 205 (1951); (f) The Role of Thiamine in Acetone Formation by Acetic-alcohol Bacteria (with I M Lur'e) in Mikrobiologiya 21, 155 (1952).

22. Meisel' is a very prolific worker, largely in the methods of identifying structures of living cells. He has done a great deal of work on fluorescence microscopy and has numerous publications in this field. He is affiliated with the Microbiological Institute of the Academy of Sciences of the USSR in Moscow, and his typical recent publications include the following: (a) Use of E Magusii for Vitamin B_1 Assay (with E N Odintsova and A A Guseva) in Mikrobiologiya 20, 273 (1951); (b) Activation of Microbial Cell by Nicotinic Acid in Doklady Akad Nauk SSSR 58, 137 (1947); (c) Luminescence Microscopy in Analysis of Living Matter, Izvest Akad Nauk SSSR, ser fiz 788 (1951); (d) Fluorescence Microscopy for Determination of State of Living Matter (with T M Kondrat'eva and N A Pomoshchnikova) in Zhur Obshchei Biol 12, 312 (1951); (e) Action of Carcinogenic Hydrocarbons on Bacteria (with N B Zavarzina) in Zhur Obshchei Biol 8, 52 (1947).

23. 50X1-HUM
the work of Zil'ber has been mostly in the fields of cancer and bacteriology. No affiliation is mentioned in his most recent publications which are (a) Symbiosis of Viruses and Bacteria, a review in Uspekhi Sovrem Biologii 33, 81 (1952); (b) Specific Components of Malignant Tumors, a review in Uspekhi Sovrem Biologii 30, 188 (1950).

24. Babskii's laboratory would most certainly shift to the military aspects provided it was ordered to do so by Soviet authorities.

the following Soviet journals might carry information on research in cholinesterases:

Biokemia
Physiological Journal of the SSR
Archives of Biological Sciences
Bulletin of Experimental Biology and Pathology
Reviews of Modern Biology
Journal of Pharmacology
Journal of Pharmacology and Toxology

26. The proper spelling of the first journal you list is Biokhimiya. The last journal you list is the Journal of of Pharmacology and Toxicology rather than the Journal of Pharmacology and Toxology.

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